

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-6 (Canceled).

Claim 7 (New): A method for fabrication of a diamond semiconductor, comprising:  
while heating a thin diamond film layer of a quality high enough to emit ultraviolet light at room temperature by excitation using electron beam irradiation when it has a thickness of not less than 200 nm, which thin diamond film layer is formed at a methane gas-to-hydrogen gas concentration of 0.016 to 2.0%, implanting ions of dopant elements into the thin diamond film layer in an ion implantation amount less than a maximum ion implantation amount that varies depending on a temperature at which the thin diamond film layer is maintained without being graphitized, wherein the diamond semiconductor thus fabricated exhibits conductivity determined by a kind and a concentration of the dopant elements.

Claim 8 (New): The method according to claim 7, wherein the ions of dopant elements are implanted into the thin diamond film layer under implantation energy in a range of from 10 keV to 1000 keV, and an ion implantation amount in a range of  $1 \times 10^{16}$  to  $1 \times 10^{21}/\text{cm}^3$ .

Claim 9 (New): The method according to claim 7, wherein the temperature at which the thin diamond film layer is maintained is in a range of room temperature to 800°C.